

DRAFT AS CIRCULATED ON OCTOBER 18, 2005, 4:00 PM

STREAM PROTECTION TOOLS MATRIX

Color Key:

Black: Existing efforts

Green/italics: New efforts already being pursued

Red/underscored: New efforts not being pursued

Note: The intent of this matrix is to present a set of possible actions that would support stream protection. The list has been generated from ideas that were identified at the September 14, 2005 joint meeting of the Planning Commission Environment Committee and EQAC as well as from the perspective of County staff. New ideas presented herein should not be considered to be staff recommendations; rather, these ideas are presented in order to further the discussion.

STREAM PROTECTION TOOLS MATRIX

Part 1: Physical Protection Techniques

Technique	Description	Options	Considerations
Resource Protection Area (RPA) requirements	Ordinance requirement for protection of all perennial bodies of water and associated wetlands by 100 foot buffer areas (major floodplains also included). Applies to all development uniformly	Leave Alone	<ul style="list-style-type: none"> Recent processes to revise the Chesapeake Bay Preservation Ordinance and map perennial streams throughout the County have been lengthy and thorough. Implementation experiences still very recent Are perennial streams being accurately and adequately identified and protected? Intermittent/other streams remain unprotected outside of floodplains
		<u>Expand to include headwater/intermittent/ephemeral/??? streams</u>	<ul style="list-style-type: none"> <u>How to define “intermittent,” “headwater,” “ephemeral,” or ??? stream—for purposes of ord. implementation would be challenging</u> <u>Should ephemeral streams be included?</u> <u>If regulatory protection of headwaters streams is sought, this could provide a logical approach given the existing RPA framework</u> <u>Scientific justification/functions of buffer areas/water quality benefits/magnitude of the benefits to stream quality</u> <u>Legal authority</u> <u>Appropriate widths of buffer areas in headwaters areas (do they need to be 100-feet wide?)</u> <u>Relationship of buffer width determination to ecological interdependency between waterways and surrounding areas</u> <u>Implications to stormwater management facility siting</u> <u>Site density and design implications</u> <u>Implications to existing development/land owners</u> <u>Acreage and stream miles to be protected</u> <u>Process, costs, and resources for mapping; definitions and designation protocols</u> <u>Potential confusion over frequent rule changes?</u> <u>To what extent are we able to proactively identify critical headwater areas where buffers would be most beneficial?</u> <u>Pending plans</u>

Part 1: Physical Protection Techniques (continued)

Technique	Description	Options	Considerations
Resource Protection Area (RPA) requirements (continued)	Ordinance requirement for protection of all perennial bodies of water and associated wetlands by 100 foot buffer areas (major floodplains also included). Applies to all development uniformly	<u>Revise perennial stream designation protocol</u>	<ul style="list-style-type: none"> • <u>The County's current approach is a statewide model</u> • <u>What is currently being missed? Overall benefit of a refined approach?</u> • <u>Should the protocol rely more heavily on biological indicators?</u> • <u>Process, costs, and resources for mapping; definitions and designation protocols</u> • <u>Potential confusion over frequent rule changes?</u> • <u>Implications if a revised protocol significantly modifies what is identified/mapped as "perennial:"</u> <ul style="list-style-type: none"> - <u>Scientific justification of revised designation</u> - <u>Magnitude of the benefits to stream quality versus costs</u> - <u>Implications to stormwater management facility siting</u> - <u>Site density and design implications</u> - <u>Implications to existing development/land owners</u> - <u>Acreage and stream miles to be protected</u>
		<i>Tighten criteria for perennial stream reclassification as being pursued by staff</i>	<ul style="list-style-type: none"> • <i>Need for uniformity regarding the use of a standard drought index</i> • <i>Public notification/comment measures</i> • <i>Lack of definition of "water body with perennial flow" in State regulations</i>
		<u>Tighten criteria for perennial stream reclassification beyond what is currently being pursued</u>	<ul style="list-style-type: none"> • <u>Legislative vs. administrative determinations</u> • <u>Public notification/comment measures</u> • <u>New requirements under way have not yet been tested</u> • <u>Potential confusion over frequent rule changes?</u> • <u>Lack of definition of "water body with perennial flow" in State regs</u> • <u>Appl. of "perennial stream" to surface flow & not subsurface flow</u> • <u>Implications of the above to the consideration of water moving through sediments of a stream bed</u> • <u>Extent to which surface flow is the critical medium for aquatic life</u> • <u>The extent to which the reclassification procedure would be consistent with the ordinance definition of "water body with perennial flow"</u> • <u>Regulatory implications of the above</u> • <u>Magnitude of benefits to stream quality</u>

Part 1: Physical Protection Techniques (continued)

<u>Technique</u>	<u>Description</u>	<u>Options</u>	<u>Considerations</u>
Floodplain Regulations	Restrictions of uses allowed in major floodplains (drainage area equal to or greater than 360 acres) and limitations on uses in all floodplains (drainage area greater than 70 acres). Applies to all development uniformly	Leave Alone	<ul style="list-style-type: none"> Limited number of SEs sought/approved; many of these in New Alexandria Effectiveness of use limitations in limiting activities in minor floodplains The primary purpose of the floodplain regulations is related to public safety and property damage
		<u>Restrict by-right uses in minor floodplains (require more SEs)</u>	<ul style="list-style-type: none"> <u>Effectiveness of use limitations in limiting activities in minor floodplains</u> <u>Implications to existing home/land owners</u> <u>Environmental benefits</u> <u>Implications to SWM facility siting</u> <u>Most floodplains already protected by RPAs</u> <u>Acreage and stream miles to be protected</u>
		<u>Revise definition of floodplain to include headwaters areas (drainage areas of less than 70 acres)</u>	<ul style="list-style-type: none"> <u>Definition of appropriate headward extent of "floodplain"</u> <u>Need to establish that the County has the enabling legislation to do this</u> <u>Implications to SWM facility siting</u> <u>Implications to existing home/land owners</u> <u>Implications to developers</u> <u>Environmental benefits</u> <u>Relationship to public safety and property damage</u>

Part 1: Physical Protection Techniques (continued)

Technique	Description	Options	Considerations
Environmental Quality Corridor (EQC) policy	Comprehensive Plan policy supporting protection of environmentally-sensitive areas; focus on core area of the stream valley, including floodplains, adjacent steep slopes, associated wetlands, and minimum buffer areas. Flexible in site-by-site designations/delineations based on purposes of the EQC system. Applies only to development approved through the zoning process.	Leave Alone	<ul style="list-style-type: none"> • Flexibility to include headwater streams above floodplains (70-acre drainage) on a case-by-case basis • Has gained widespread acceptance in its application • Headwaters EQCs typically not sought in fragmented areas (emphasis on the “corridor”), but this is a case-by-case determination • To what extent are important opportunities for preservation missed? Is there a problem with how the policy is being applied? • If there is a problem, is the solution a Plan amendment or a revision to how the current policy is applied? • Should a detailed assessment of biological diversity be performed in evaluating areas for consideration as EQCs? • Does not apply to by-right development
		<u>Add language to explicitly include intermittent streams, ephemeral streams, and/or stream channels generally</u>	<ul style="list-style-type: none"> • <u>Definition of what we’re trying to protect</u> • <u>Implications to stormwater management facility siting</u> • <u>Overall density and site design implications; impacts to developers</u> • <u>Incorporation of more flexibility in buffer width policy?</u> • <u>Would not apply to by-right development.</u>
		<u>Eliminate density credits for floodplains/EQCs</u>	<ul style="list-style-type: none"> • <u>Density credits are currently allowed to a large extent</u> • <u>Incentive for protecting sensitive areas—would developers be less inclined to protect EQCs because of inability to recover density?</u> • <u>Effect of density credits in concentrating development at higher effective density on the less-sensitive portions of sites—compatibility and stormwater management implications</u> • <u>Does increased development density necessarily equate to increased impervious cover and increased stream impact? Is this truly a stream protection technique?</u>

Part 1: Physical Protection Techniques (continued)

Technique	Description	Options	Considerations
General Comprehensive Plan guidance	Environmental Objective 2 supports stream protection. Applies only to development approved through the zoning process.	<u>Add language generally supportive of protected buffer areas around headwater/intermittent/ephemeral/all streams</u>	<ul style="list-style-type: none"> • <u>Ability to apply on a case-by-case basis</u> • <u>How wide should buffers be?</u> • <u>To what extent are we able to proactively identify critical headwater areas where buffers would be most beneficial? Should the policy language focus on these areas?</u> • <u>General approach to Plan guidance vs. EOC expansion approach</u>
Open Space/Conservation Easements	Establishment of restrictions on the use of sensitive, privately-owned land through agreements reached between a nonprofit land trust or government agency and landowners. Applies only through voluntary agreements	<u>Allow more easements on privately owned lots (e.g., BMP credits)</u>	<ul style="list-style-type: none"> • <u>Monitoring and enforcement</u> • <u>Sufficiency of incentives to landowners to protect sensitive resources</u> • <u>Opportunity to protect environmentally sensitive land that would not otherwise be protected</u> • <u>Stormwater management and related ecological benefits (e.g., increased infiltration and times of concentration)</u> • <u>If only some of the lots have easements, the burden (property restrictions) of providing BMPs for the subdivision as a whole will fall disproportionately on some property owners</u> • <u>Tax/revenue implications?</u>
		<u>Restrict County's ability to clear vegetation in or "near" floodplain/utility easements</u>	<ul style="list-style-type: none"> • <u>Adequate maintenance of utilities</u> • <u>Benefits of perpetually undisturbed open space</u> • <u>If the use of areas immediately adjacent to the utility easement is restricted, utility easements will become larger</u> • <u>Consider separate floodplain and storm drainage easements rather than a combined floodplain/storm drainage easement</u>

Part 1: Physical Protection Techniques (continued)

<u>Technique</u>	<u>Description</u>	<u>Options</u>	<u>Considerations</u>
Open Space/Conservation Easements (continued)	Establishment of restrictions on the use of sensitive, privately-owned land through agreements reached between a nonprofit land trust or government agency and landowners. Applies only through voluntary agreements	<u>Increased publicity regarding the purpose and benefits of easements</u>	<ul style="list-style-type: none"> • <u>Extent of effort</u> • <u>Prioritization of publicity/outreach efforts (e.g., intensive effort in one area vs. less intensive Countywide effort)</u> • <u>Past funding decisions related to the County/NVCT partnership and new funding needs</u> • <u>Staff resources</u>
		<u>Increased funding to the Northern Virginia Conservation Trust</u>	<ul style="list-style-type: none"> • <u>Past funding decisions related to the County/NVCT partnership and new funding needs</u> • <u>Level of additional funding needed—To what end(s) would increased funding be used?</u> • <u>Prioritization of efforts (e.g., intensive effort in one area vs. less intensive Countywide effort)</u>
		<u>Integration into the watershed planning process</u>	<ul style="list-style-type: none"> • <u>Focus to date has been related to capital projects (e.g., retrofits and restoration) and not land preservation—would be a new direction for the program</u> • <u>Lack of such integration into the first several watershed planning processes</u> • <u>Prioritization of efforts</u>
Zoning Incentives	Incorporate one or more incentives into the Zoning Ordinance (or elsewhere??) to encourage voluntary commitments to stream buffers beyond what is required by ordinance. Applies uniformly to all development but only as pursued voluntarily	<u>Offer bonus density and/or reduction in minimum required open space (where applicable) for provision of buffers beyond what is required by ordinance</u>	<ul style="list-style-type: none"> • <u>Definition of circumstances where this would apply</u> • <u>Determination of extent of bonus density that may be appropriate—how much of a buffer is needed to trigger the bonus?</u> • <u>Should EQC delineation criteria be incorporated into this idea?</u> • <u>Site compatibility associated with bonus densities</u> • <u>Potential local implications of bonus densities (e.g., transportation; compatibility with adjacent neighborhoods; impervious cover)</u> • <u>Implications to development pursued through the zoning process (e.g. expectations of bonus densities for EQC preservation)?</u>

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Part 2: Stormwater Management Techniques

Technique	Description	Options	Considerations
Stormwater detention requirements	Temporary storage of stormwater runoff associated with a particular design storm (e.g., 2-year or 10-year storm)	<i>Strengthen overall detention requirements</i>	<ul style="list-style-type: none"> • <i>Recommendations to be developed by staff (to be pursued at some time after experiences are gained with revised adequate outfall requirements)</i> • <i>Require detention of the 1-year 24-hour storm in lieu of the 2-year storm per DCR guidance?</i>
		<i>Strengthen detention requirements for redevelopment</i>	<ul style="list-style-type: none"> • <i>To be considered in the overall evaluation of detention requirements</i> • <i>Should the basis of predevelopment flow rates be “forest in good condition” as opposed to the existing use on a site?</i> • <i>Opportunities to greatly improve upon existing stormwater runoff conditions</i> • <i>Disincentive to redevelopment/revitalization?</i> • <i>Recently adopted Plan policy supporting optimization of SWM for redevelopment consistent with revitalization goals</i> • <i>Constraints imposed by existing drainage system</i>
Adequate Outfall requirements	Protection of properties and waterways downstream from development sites from damage due to increases in volume, velocity, and peak flow rate.*	<i>Review and revision of adequate outfall requirements. PC public hearing anticipated in Spring, 2006.</i>	<ul style="list-style-type: none"> • <i>Difficulties in complying with current PFM requirements</i> • <i>Implementation of recommendation SW-12 of the Infill and Residential Development Study</i> • <i>Extent of downstream review</i> • <i>Requirements if outfall is inadequate</i> • <i>Equitable distribution of improvements to existing outfalls for large vs. small projects</i> • <i>Increased clarity and consistency in extent of downstream review</i> • <i>Assessment of adverse impacts that takes into account vol. increases</i> • <i>Onsite option to address adequate outfall avoids disruption of streams by armoring, widening, etc.</i>

* Current requirements are that natural channels are adequate if the peak flow from the 2-year frequency storm can be carried within the channel banks at a non-erosive velocity. Previously constructed man-made channels must be able to carry the peak flow from the 10-year storm without overtopping the banks and the 2-year storm at non-erosive velocities. Pipes and storm sewer systems must contain the peak flow from the 10-year storm within the pipe or system.

Part 2: Stormwater Management Techniques (continued)

Technique	Description	Options	Considerations
Impervious cover limits	(See options)	<u>Establish maximum impervious cover requirements within each zoning district</u>	<ul style="list-style-type: none"> • <u>Need for flexibility, particularly in P Districts and revitalization/redevelopment areas</u> • <u>How would standards be established?</u> • <u>Enforcement</u> • <u>Implications to existing homeowners/landowners—some homeowners may be unable to expand/improve existing dwellings—potential for deterioration of neighborhoods where this would be common?</u> • <u>Potential for creation of many nonconforming uses</u> • <u>Flexibility where additional drainage is controlled (e.g., LID techniques; infiltration)?</u>
Low Impact Development (LID) practices	Small-scale stormwater management/water quality practices that can be integrated into site design; concept is to replicate the pre-development hydrograph to the extent possible.	<i>Incorporation of six LID practices into the Public Facilities Manual-- PC public hearing anticipated in Spring, 2006</i>	<ul style="list-style-type: none"> • <i>Maintenance</i> • <i>Long-term performance of LID practices</i> • <i>The extent to which LID practices should be allowable on private residential lots to meet site and subdivision ordinance requirements</i> • <i>Additional “tools in the toolbox” as opposed to mandates</i>
		<i>Assessment of zoning/subdivision/site design requirements/barriers to LID</i>	<ul style="list-style-type: none"> • <i>Forthcoming white paper from consultants under contract to the County</i> • <i>Can/should County site design requirements be revised to better support the LID concept?</i> • <i>To what extent does the County even have authority to do this (e.g., public street standards)?</i> • <i>Staff resources available for review</i> • <i>Difficulty in resolving conflicts with other priorities</i>
		<u>Incentives for LID implementation/imp. surface reduction: Expedited site plan reviews; density/FAR incentives; commercial parking requirement reductions; setback requirement reductions</u>	<ul style="list-style-type: none"> • <u>Staff resource issues to expedite site plan reviews</u> • <u>Criteria to establish eligibility for incentives</u> • <u>Impact of density/FAR incentives on transportation and compatibility</u> • <u>Impact of setback requirement reductions on compatibility, safety</u> • <u>Parking capacity implications of requirement reductions</u> • <u>Legal implications</u>

Part 2: Stormwater Management Techniques (continued)

Technique	Description	Options	Considerations
Erosion and Sediment Controls	Controls on sites undergoing development to reduce downstream drainage and sed. impacts	<i>Revise standards for E&S controls during site development activities</i>	<ul style="list-style-type: none"> Recent Letter to Industry (10/3/05) on Additional Information Required on Construction Plans to Assist in the Implementation of Adequate Drainage and Erosion and Sediment Controls
Parking requirements	Revising parking requirements to reduce runoff volumes	<u>Incorporate porous pavement concepts into the forthcoming amendment addressing residential parking requirements</u>	<ul style="list-style-type: none"> Circumstances where porous parking may be appropriate and where it may be inappropriate Forthcoming effort to incorporate porous parking guidance into the PFM (per the LID review described earlier) Maintenance/long-term upkeep and costs Ability to assign SWM/BMP credits—sufficient data available? Long-term performance Soil conditions/viability of pavement Adequacy and accessibility of parking (e.g., accessibility for people with disabilities?) Should there be a limitation on the amount of porous pavement permitted for required parking? Should there be a required minimum percentage of pervious parking?
		<u>Establish more general requirements for porous pavement in parking areas</u>	<ul style="list-style-type: none"> Circumstances where porous parking may be appropriate and where it may be inappropriate Maintenancelong-term upkeep and costs Soil conditions/viability of pavement Adequacy and accessibility of parking (e.g., accessibility for people with disabilities?) Should there be a limitation on the amount of porous pavement permitted for required parking? Conversely, should there be a required minimum % of pervious parking?
		<u>Establish parking maximums in addition to minimums</u>	<ul style="list-style-type: none"> Extent to which existing development is “overparked” Economic considerations How much is too much? Incentives for LID/infiltration measures Impacts to existing “overparked” uses should maximums be adopted

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Part 3: Restoration Techniques (Capital Projects)

Technique	Description	Options	Considerations
Watershed Management Planning	Comp. assessment of watershed conditions and implications of land use changes, including the comp. identification of stream/watershed restoration project needs	<i>Completion of watershed management plans, either as scheduled or on an expedited basis</i>	<ul style="list-style-type: none"> • <i>Resource availability to expedite the process</i> • <i>Implementation of projects</i>
Stream Stabilization and Restoration projects	Using geomorphic and soil bioengineering technologies to address the physical, biological, and chemical properties of stream systems and restore the equilibrium of their channels, banks, and riparian areas.	<u>Implement stream restoration and stabilization projects identified in watershed management plans (or as otherwise identified), either through capital projects or voluntary efforts (e.g., proffers)</u>	<ul style="list-style-type: none"> • <u>The extent to which streams need to be “destroyed” in order to be saved</u> • <u>Resource availability</u> • <u>Watershed goals</u> • <u>Appropriate option for projects:</u> <ul style="list-style-type: none"> - <u>Nonintervention and undisturbed recovery (where the stream system is recovering rapidly and active intervention is unnecessary or detrimental)</u> - <u>Partial intervention for assisted recovery (where the stream system is stabilizing slowly or uncertainly; where action will facilitate and accelerate natural processes already under way)</u> - <u>Substantial intervention for managed recovery (where recovery of desired stream functions is beyond the repair capacity of ecosystem and active intervention and associated measures are needed)</u>
Other watershed management plan projects (e.g., obstruction removal; debris/trash removal; LID retrofits)	A lengthy list of projects identified in watershed management plans (e.g., obstruction removal; debris/trash removal; SWM retrofits; LID retrofits)	<i>Prioritize and implement watershed management plan projects</i>	<ul style="list-style-type: none"> • <i>Resource availability</i> • <i>Watershed goals</i>